No. III.

INSECTS INFESTING THE SUGAR-CANE.

The GOLD CERES MEDAL *was voted to the Rev.* LANSDOWN GUILDING, *B.A., F.L.S., F.G.S., &c. for his Memoir on the Insects that infest the Sugar-Cane in the West Indies.*

INSECTA COLEOPTERA.

Curculionites. Lat.

** Fracticornes.

Fam. *Calandradæ.* Guild.

Genus *Calandra Clairv.* Fab., Lat.

Curculio. Linn.

CHARACTER GENERICUS.

**Caput* parvum, immersum: *oculi* magni, oblongi, caput cingentes. *Antennæ* in fossulâ baseos *rostri* elongati, cylindrici, nutantis, ante oculos positæ; articulis octo vel novem, *scapo* longissimo, cylindrico, clavolæ longitudine, *capitulo* solido, bifariam truncato, apice coriaceo, spongioso. *Mandibulæ* tridentatæ, validæ. *Corpus* elliptico-ovatum, suprà planum. *Thorax* antice in collare constrictus. *Elytra*

* *Head* small, immersed; *eyes* large, oblong, surrounding the head. *Antennæ* from a fissure in the base of the elongated, cylindrical, deflexed *rostrum*, placed before the eyes; clavola eight- or nine-jointed, on a cylindrical stem, as long as the clavola; *terminal joint* solid, oppositely bevelled, terminated by a spongy coriaceous point. *Mandibles* strong, three-toothed. *Body* elliptic-ovate, flat above. *Thorax* contracted

brevia, truncata. *Alæ* elongatæ, neuris validis. *Anus* acutè prominulus, deflexus. *Pedes* in omnibus validissimi, femora inermia, gonytheca profunda, tibiis intùs ciliatis, duabus vel quatuor anticis sæpè intùs unidentatis, pilis nonnunquam in femoribus et tibiis in penicillum dispositis. *Calcaria* terminalia, incurva, validissima: tarsi tetrameri: *allux* cordatus. *Sola* densè vestita. — Vide *Latr. Gen. Crust. et Ins.*

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1. *Calandra palmarum.* Fabr., Lamar.

Curculio palmarum. Linn.

C. aterrima, elytris subquinque striatis, striis lateralibus abbreviatis: podice triangulari, ciliato: rostro (maris) scopulâ densâ longitudinali.

C. dark black, elytra with five larger, and a few abbreviated lateral striæ. Podex triangular and ciliated, the rostrum of the male furnished with a longitudinal brush.

Descriptio.

**Corpus* durissimum, nuper declaratum, atro pruinatum, mox nitens: hic et hic obscurè punctulatum: *femora* intùs hirsuta, basi fasciculata: *tibiæ* quatuor anticæ unidentatæ,

anteriorly. *Elytra* short, truncated. *Wings* elongated, with strong fibres. *Anus* somewhat acutely prominent, deflexed. *Feet* very strong, femora unarmed, gonytheca deep, tibiæ ciliated internally; the first, and sometimes also the second anterior pair, unidentate internally; femora and tibiæ sometimes bearing pencils of hair. *Calcaria* terminal, incurvated, very strong: tarsi in four joints: *allux* heart-shaped. *Soles* densely clothed.

* *Body* very hard, at first dull with black dust, afterwards shining; here and there obscurely dotted: *femora* hairy internally, fasciculated at their base: *tibiæ*, the two anterior pairs one-toothed, fasciculated:

fasciculatæ: *elytra* apice sinuosa: *hypoderma* flavidum: *alæ* nitentes, nigro flavescentes: *rostrum* fœminæ debile, nudum: *oviductus* tubulo exserto incurvo: antennarum *capitulum* villosulum: acaris sæpè infestatur: expansio alarum 2 unc. 11 lin.

Larva brevis, obesa, ferrugineo-flavum, *capite* brunneo, *labro* spinuloso. *Thoracis, caudæ* complanatæ maculæ, puncta setigera sparsa, spinæque terminales obtusæ, ferrugineæ: *anus* obliquè truncatus, maculis duabus lunatis spiraculiferis: *spiracula* minuta.

Nympha ferrugineo-flava, *rostro* corrugato, hirsuto: *segmenta* abdominalia adminiculis et spinulis sparsis: *ano* obtuso, scabro, lateribus corrugatis

Folliculus maximus, è fibris palmarum contextus, acaridis innumeris intùs habitantibus in hoc stadio infestatur.

The strength of the legs of these insects is incredible. I have known one by pressure to bring to the ground a large bird, which had seized it in his bill. Some species pinch severely by pressing the rostrum to the breast.

Explanation of the Figures.

1. The female flying; 2, the male creeping; 3, the terminal

elytra sinuated at their apex: *hypoderma* yellowish: *wings* shining, of a brownish yellow colour: *rostrum* of the female weak, naked: *oviduct* with bent exserted tube: *capitulum* of the antennæ somewhat villous: expansion of the wings 2 inches 11 lines. Is often infested with acari.

Larva short, fat, rusty yellow; *head* brown, upper *lip* spinulose: the spots of the thorax and of the flattened tail, the setigerous dots of the body, and the terminal obtuse spines, of a ferruginous colour. *Anus* oblique, with two lunate spots, bearing minute spiracula.

Nympha brownish yellow; *rostrum* corrugated, rough: abdominal segments covered with scattered hairs or bristles. *Anus* obtuse, rough, with corrugated sides.

Case very large, composed of intertwined palm fibres, usually (in this colony) affording shelter to multitudes of acari.

segment of the antennæ; 4, the gonytheca; 5, the rugose apex of the rostrum; 6, the same viewed from the under side; 7, the larva; 8, the pupa; 9, the case or follicle;—all of the natural size.

Inhabits the Tropics. The larva perforates dead or injured palms, chiefly the gru-gru (cocos fusiformis), and occasionally attacks the sugar-cane.

The larvæ are highly valued by the old Creoles, who send negroes into the woods to cut open decayed palm-trees, and procure these fat and precious dainties. They are fried in the same manner as the Hottentots (who alone should eat them) dress the swarms of termites; though, I believe, with the addition of butter, which they do not seem to require. It is but fair to add, that this disgusting dish is but seldom produced at the present day.

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2. *Calandra sacchari.* Guild.

The larger Borer.

C. vitellino atroque varia, thorace trilineato, elytris punctato-striatis, alis nigro-fulvis, neurâ costali serrulatâ, tergo sericeo-flavo.

C. varied with black and yolk-yellow: thorax with three black lines: elytra punctate, striated: wings black, fulvous: the costal nervure serrulated: back silky yellow.

The larva is found in the sugar of the West Indies: the perfect insect is often to be met with in decayed vegetable matter. Length of the body $\frac{6}{10}$ths of an inch; spread of the wings 1 inch 1 line.

**Corpus* obscurè punctulatum: *thorax* vitellino-flavus, lineis tribus nigris, lateralibus abbreviatis: *pectus* nigrum, lineis

* *Body* obscurely punctated: *thorax* egg-yellow, with three black lines, the lateral ones the shorter: *breast* black, with three yellow lines: the

tribus flavis: *ventris* maculæ tres, *femorum*que fasciæ, flavæ: *elytra* atra, flavo maculata, striarum puncta papillata: *scutellum* antice flavum: *rostrum* apice nigrum: *pulmonaria* prominula.

Var. β. Sanguineo-castanea, elytrorum margine maculâque disci trilobatâ nigris: *femora* simplicia: *antennæ* villosulæ.

Larva obesa, flavescens, adminiculis scabra: *ano* declivi, setoso: *latera* prominula: *spiracula* majora: *caput* hirsutum, *collum*que ferruginea: *mandibulæ* brunneæ, validæ.

Nympha flavo rufescens: *capite* bi-tuberculato, bi-setoso: *rostrum* medio tumidum, quadri-setosum: *femora* apici uni-setosa: *anus* appendiculatus, appendiculis setiferis: *abdomen* spinulosum.

Explanation of the Figures.

1. Calandra sacchari; 2, variety of the same; 3, the case or follicle; 3 *a*, the case in the stem of a sugar-cane; 3 *b*, an empty case; 4, the pupa, magnified, seen from below; 5, the pupa seen from above; 6, the larva, magnified.

Mr. Kirby thinks this insect may be the C. sericea *Oliv.* pl. 28, f. 409.

spots of the *belly* and fasciæ of the *thighs* yellow: *elytra* black, spotted with yellow: *scutellum* yellow in front: *rostrum* yellow at the point: *chest* somewhat prominent.

Var. β. chestnut red, the margin of the elytra and the trilobate spot of the disk black: *thighs* simple; *antennæ* somewhat villous.

Larva fat, yellowish, scabrous with small bristles: *anus* depending, bristly: *sides* prominent: *spiracula* rather large: *head* hairy, and, as well as the *neck*, ferruginous: *mandibles* brown, strong.

Nympha russet-yellow: *head* bi-tubercular, with two setæ: *rostrum* tumid in the middle, with four setæ: *thighs* with one seta at the apex: *anus* with setiferous appendages: *abdomen* spinulose.

INSECTA LEPIDOPTERA.

Fam. *Pyralidæ*. Leach.

Genus *Diatræa* (à διατρέω, perforo). Guild.

CHARACTER GENERICUS.

**Caput* parvum: *oculi* subprominuli: *antennæ* setaceæ, inter oculos in vertice positæ, suprà squamulosæ, subtùs ciliatæ, scapo majori vix in maribus crassiores. *Antlia* brevis: *palpi* quatuor, squamis longis hirsutissimi: *maxillares* breves, bi-articulati, articulo basilari curvo, ultimo crassiori subovato, apice subacuminato: *palpi labiales* horizontaliter elongati, rostriformes, longissimi, tri-articulati, articulo basilari brevi, curvo, crasso, secundo attenuato, tertio brevi, minori: *vertex* hirsutus: *facies* minùs vestita: *alæ* superiores in quiescente deflexæ, elongato subtriangulares, inferiores minùs plicatæ: *fibulâ* completâ: *pedes* breves, medii longiores, anteriores *culcitâ* parvâ. *Tarsi* omnes pentameri, femora gracilia: *tibiæ* quatuor anticæ bi-calcaratæ, posticæ quadri-calcaratæ, (maris) flocculiferi: *unguiculi* breves.

* *Head* small: *eyes* rather prominent: *antennæ* setaceous, placed between the eyes on the vertex; scaly above, ciliated beneath; in the male scarcely thicker than the stem: *antlia* short: *palpi* 4, very rough with long scales; the maxillary ones short, bi-articulate, the basilary joint bent, the last thicker, subovate, somewhat pointed at the extremity; the *labial palpi* very long, rostriform, horizontal, tri-articulate, the basilary joint short, thick, curved; the second attenuated, the third smaller and shorter: *vertex* hirsute; *face* more bare: *upper wings* deflexed when the insect is at rest, elongated, subtriangular; the *lower wings* less folded: *fibula* complete: *feet* short, the middle pair longer, the anterior with a small *culcita*. *Tarsi* pentamerous, thighs slender, *tibiæ* of the two anterior pair of legs 2-spurred, of the hinder pair 4-spurred, and in the male flocculiferous: *unguiculi* short.

Larva elongata: pedes 6; propedes, abdominales 8, anales 2: *adminiculis* coronâ completâ dispositis: *spiracula* cervicalia 2, abdominalia 16: *segmenta* abdominalia 12; 1, 2, 3, 6, 7, 8, 9, et ultimo pedatis. *Pupa* elongata, sigillis mesothoracis longitudinalibus: *segmentorum* adminiculis sparsis: *ano* angulato, spinoso.

Diatræa sacchari.

The Borer.

D. straminea, alis superioribus sordidè ochraceis, lineis duabus obliquis nigricantibus, disci atomo unico, marginis plurimis atris: alis inferioribus pedibusque argenteo-flavidis.

D. straw-coloured, upper wings dirty ochre, with two blackish oblique lines, one black dot in the centre, and several on the margin: lower wings and feet pale yellow. Larva yellowish, spotted with black, rather hairy; head and neck ferruginous; dorsal line yellowish; lateral spots livid; thoracic feet 6; abdominal 8; anal 2. Body much lengthened.

Explanation of the Figures.

1. The male, magnified; 2, the real size of the insect.

1 *a*, the head; 1 *b*, one of the labial palpi; 1 *c*, one of the maxillary palpi; 3, the larva, magnified; *a*, one of the propedes or membranous feet; 4, the pupa; 5, portion of a sugar cane;

Larva elongated: feet 6; propedes, abdominal 8, anal 2; the bristles disposed in a complete ring: *spiracula*, cervical 2, abdominal 16: *abdominal segments* 12; 1, 2, 3, 6, 7, 8, and the last furnished with feet.

Pupa elongated; *sigillæ* of the mesothorax longitudinal; bristles of the segments scattered: *anus* angulate, spinous.

a, the hole bored by the larva for the escape of the winged insect; *b b*, holes by which the young larva enters, the eggs having been deposited under the sheath of the leaves; 6, anterior foot of the sphinx, *a*, the culcita; 7, 8, the culcita and cavity in which it is contained shewn separate; 9, anterior foot of the conocephalus, shewing the two openings of the scutula: 10, foot of the pterophylla (Kirby); 11, foot of the acheta (Fabric.); *a*, the small scutula on the other side of the limb.

The extensive injuries occasioned by the animals which are here briefly described, are well known in Europe, and many great rewards have been held out to those who should discover a method of banishing these plagues from our colonies in the West Indies.

The *Calandra palmarum* is principally injurious to the plants lately stuck in the ground, to which the female is allured by the juices which are exuded. These they sometimes attack so vigorously that a fresh planting becomes necessary. They do not seem to deposit their eggs in full-grown canes, when palms are abundant in the neighbourhood.

Calandra sacchari confines itself principally to such canes as have been slightly injured; though it sometimes attacks the more vigorous plants, which it excavates to the very ground, voiding its excrements in scarcely discoloured grains, which fill up the passage.

But by far the most destructive and common enemy is the smaller grub of the moth, whose description is given above. The sugar-cane, so valuable to man in all its parts, is never exempt from this dreaded pest. Fortunately, in the seasonable climate of St. Vincent, from our improved cultivation, the animal is not very formidable; but in some other of our colonies, which,

from the absence of mountains, or other causes, are subject to dry seasons, they have been known to blast the hopes of the year, to destroy whole acres of canes, and ruin the unfortunate planter. The Society of Arts has long offered rewards for the expulsion of the borers, but, I think, will do well in future to omit the premium offered for their destruction, inasmuch as it is to be feared no remedy can be applied on extensive tracts of land, which would not at the same time destroy the plant we would protect, or which would not prove too expensive for general adoption. The object of the planter should be to prevent the insects from depositing eggs in the plants, rather than to kill those which have already begun their operations.

Those animals which the Creator has thought fit to form and preserve for ages, man will not be permitted to *exterminate:* we may, however, with propriety, strive, by all means in our power, to lessen the number of those creatures which injure or destroy our property. From long-continued experiments I have at last discovered that they may be almost entirely expelled from any quarter in which the canes are carefully stripped of the dry and useless leaves, under which, as they become loose, the female borer deposits her eggs.

These animals, when they assail us in moderate numbers, act only as a stimulus, wisely sent to rouse the inattentive planter to cleaner and more careful modes of husbandry. When they swarm so as to deprive him of his crops, the loss must in future be attributed either to his obstinacy or his negligence.

It is well known that the vaginating leaves of the cane hold for a long period the water which has been

collected in them during rains, from which, in dry weather, the plant may doubtless derive nourishment. In the drier islands, the planter will probably object to the only plan which seems capable of lessening the number of his foes, under the idea that he will expose the plants too much to the merciless rays of the sun. I do not by any means recommend that a single living leaf should be taken off; and a very slight examination will convince him that those which have begun to wither are incapable of holding water for the refreshment of the cane.

The borers are observed to be much more fatal to plant than to ratoon canes, which should of course be oftener visited by the parties of negroes whose business it is to collect the trash. A single cane will sometimes nourish several of the borer worms, which perforate every joint; when the pithy centre becoming discoloured and sour, not only yields nothing at the mill, but communicates a dark colour and bad quality to the sirop of the sounder plants.

Of the other enemies of the sugar-cane I can for the present speak but slightly. The large fire-fly (Elater noctilucus) has been said, but perhaps only accidentally, to have been bred in it. An undetermined aphis, and the "jumper fly," probably one of the Chrysomelidæ, have in some islands proved injurious, but have never been noticed here. The myriads of ants which once infested, but have now disappeared from Grenada, committed indeed the most frightful ravages; but it was rather by excavating their little metropolis beneath the roots, than by attacking the body of the cane. Were these little carnivorous agents less prolific than they

are, we might encourage them as useful helpmates in the destruction of the borers, which they pursue and kill in their cylindrical labyrinths.

Kingstown, St. Vincent, West Indies,
March 26, 1827.